REMARKS

Applicant expresses gratitude to the examiner for the personal interview conducted on April 15, 2010. Claims 28, 30-33, 35-37, 39, and 41have been amended, claims 38 and 40 have been cancelled and new claim 43 has been added. No new matter has been added.

Interview Summary

During the personal interview conducted on April 15, 2010, Dr. Schaub gave a presentation of the claimed method, as well as a demonstration of the skin-feel of the gel composition. Dr. Schaub discussed the differences between the claimed method and standard obstetric practice, as well as differences between human and veterinary obstetric practice. Applicant's representative discussed the § 112 rejections and compared them with the § 103 rejections of copending application 11/718,995. Examiner Blanchard noted that the legal standard is different for § 112 versus § 103 rejections. Applicant's representative proposed amendments to claim 28 to further clarify the steps of the claimed method as well as the components of the composition in the claimed method. Examiner Frazier noted that the amendments would be considered if submitted. An agreement was not reached with respect to the claims.

Response to Objections to Specification

The Examiner objected to the use of trademarks on page 8, lines 3-8 of the specification, requiring them to be capitalized and accompanied by generic terminology. Applicants submit that the specification has been amended to capitalize all trademarks.

Applicant submits that generic terminology is not necessary because the trademarked products listed in the specification are merely part of the background information, these products have fixed and definite meaning, and the physical or chemical characteristics of the articles or materials are not involved in the invention.

Response to Rejections under 35 U.S.C. § 112

Claims 28-42 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner asserts that the claims contain material that was not described in the specification as originally filed. With regard to claim 28, the Examiner asserts that the specific combination of a composition consisting essentially of polyacrylic acid, thickener, and humectant was not taught in the specification. The Examiner acknowledges that the specification discloses polyacrylic acid in combination with glycerol and NaCl, celluloses, and humectants and isotonicizing substances, but asserts that the specification does not specifically teach the combination of polyacrylic acid, thickener, and humectant.

As discussed during the interview, independent claim 28 has been amended to remove the "consisting essentially of" language. Further, in claim 28, as amended, the word "thickener" has been replaced with "isotonicizing substances," which the Examiner has acknowledged as being supported by page 7, lines 18-24 of the application. Thus, Applicant submits that independent claim 28 is supported by the description found on page 7, 3rd full paragraph of the specification, which recites "[c]arbopols in concentrations of from 0.25 to 5% by weight (polyacrylic acid) in combination with glycerol and NaCl, celluloses, especially in concentrations of from 1 to 3% by weight,

and in combination with humectants and isotonisizing substances." Thus, based on the above reasoning and discussions during the interview, Applicants respectfully request that the rejections under § 112 be withdrawn.

Further, the Examiner asserts that claims 30 and 31 constitute new matter because the specification does not teach that the thickener is cellulose. Applicants submit that it was well known at the time of filing that cellulose is a thickening agent and that one of ordinary skill reading the application at the time of filing would be aware of this fact. However, in the interest of advancing prosecution, claim 30 has been amended to depend from claim 28 and to delete the term cellulose and recite that the composition to be administered in the method of claim 28 further comprises a thickener. Support for this amendment is found on page 7, 4th full paragraph of the specification. Claim 31 has been amended to depend from claim 28 and to recite that the composition further comprises at least one cellulose in a concentration of from 1 to 3% by weight based on the disclosure on page 7, lines 18-24 as quoted above. Thus, based on the above reasoning and discussions during the interview, Applicants respectfully request that the rejections of claims 30 and 31 under § 112 be withdrawn.

The Examiner asserts that claims 32 and 33 constitute new matter because the specification does not teach that the humectants are selected from the group consisting of propylene glycol, glycerol, and polyethylene glycol. Applicant submits that claim 32 has been amended to depend from claim 28 and to recite that the composition comprises a substance selected from the group consisting of propylene glycol, glycerol, and polyethylene glycol, which finds support in the paragraph bridging pages 6 and 7 of the application. Claim 33 has been amended to depend from claim 28 and to recite

wherein said composition comprises carob flours in a concentration of from 0.5 to 3%, which is supported by the disclosure on page 7, lines 22-24 of the specification. Thus, based on the above reasoning and discussions during the interview, Applicants respectfully request that the rejections of claims 32 and 33 under § 112 be withdrawn.

Response to Rejections under 35 U.S.C. § 103

Claims 28, 30, 32-34 and 37-42 were rejected under 35 U.S.C. § 103(a) as being obvious over Kasahara (U.S. 3,971,848) in view of Van Leuven (U.S. 4,267,168) as evidenced by Bringloe (U.S. 4,765,478). The Examiner asserts that Kasahara discloses a composition comprising fucoidin and alginic acid that does not contain alkali metal phosphates and may be mixed with water, sodium polyacrylate and carboxymethyl cellulose (CMC) for lubricating the birth canal to facilitate the delivery of the fetus (see col. 5, lines 16-42 of Kasahara). The Examiner acknowledges that Kasahara does not mention humectants, but asserts that Van Leuven discloses humectants (1.2 o 2.5% propylene glycol and glycerol) in lubricant compositions. The Examiner further asserts that based on Kasahara's disclosure that the composition is a mucous, thready composition (col. 2, lines 7-8 of Kasahara), one skilled in the art would reasonably expect the composition to be in the form of a gel and that Bringloe discloses that CMC is a known gelling agent (col. 3, lines 46-53 of Bringloe). As demonstrated and discussed during the interview, the present invention is a novel and non-obvious contribution to the field of human child birthing. Applicant submits that claim 28 has been amended to limit the metes and bounds of claimed method to distinguish from the combination of the cited references. Accordingly, the method steps

"1) applying an effective amount of an organic lubricant composition to cover said birth canal surface with the onset of labor; and

2) additionally applying an amount of said composition to said birth canal surface during labor wherein said additional amount is effective in keeping the birth canal surface covered with said lubricant composition so that a lubricant layer is formed between said birth canal surface and said item to be delivered until said item is delivered"

have been introduced into claim 28. Support for this amendment can be found in the paragraph bridging pages 3 and 4 of the specification and the working example. As mentioned during the interview, all of the cited references stemmed from veterinary uses, and that no combination of the cited art was enabling for a method as claimed, which is intended for use in humans, and requires

1. covering the surface of the birth canal,
2. reapplying the composition so that this coverage of the birth canal surface is maintained for a prolonged application period (from "the onset of labor" until the item to be delivered is delivered),
3. wherein the composition has unique bioadhesive properties for use in humans,
4. which allows the mother to be ambulatory during this time,
5. the composition not being aqueous also to avoid safety hazards,
6. and the composition forming a lubricant layer between the birth canal surface and the item to be delivered.

Applicant submits that no combination of the cited references renders the presently claimed method obvious.

During the interview, the Examiner acknowledged that Kasahara did not use isotonicizing agents. In addition to this difference, Applicant submits that the presently claimed method is also distinguished from the cited art because the present claims require that the birth canal surface be kept covered with the lubricant composition so that a lubricant layer is formed between the birth canal surface and the item to be delivered until the item is delivered, whereas the cited references appear to teach the use of aqueous solutions, which are not analogous because an aqueous solution would lack the claimed properties and would have the disadvantage of pouring out of the birth canal, thereby not forming and suitably keeping a lubricant layer between the birth canal surface and the item to be delivered until the item is delivered. Further, Van Leuven and JP '256 instruct the reader to apply the composition "at birth" and that Kasahara mentions "just before parturition" which would have been construed by one of ordinary skill seeking to combine these references as similarly suggesting applying the composition at, or just before birth, i.e. minutes before, rather than "with the onset of labor," which is many hours before birth and with the onset of labor as is required by the present claims. The present specification states that the duration of the dilation period in primiparas is on average, 600 minutes, i.e., 10 hours before delivery (see page 11, third paragraph).

As Dr. Schaub explained during the interview, this is a fundamental difference between human and veterinary birthing. In veterinary birth procedures requiring additional lubrication, an aqueous lubricant is pumped into the animal's birth canal just before delivery when an obstruction is realized. In contrast, the presently claimed method is intended to ease child birthing as a proactive step, which is intended to be

initiated with the onset of labor and additionally applied to keep the birth canal surface covered so that a lubricant layer is formed between the surface and the item to be delivered until the item is delivered. Aqueous solutions, such as those used in the veterinary arts, would not be applicable in humans because 1) they would be expelled by the mother's movement and/or during water births, and also by the progression of item to be delivered through the birth canal, and 2) a practitioner cannot safely or practically continuously pump an aqueous lubricant into a human mother as is the procedure in animals. The presently claimed method avoids these disadvantages by using the presently claimed composition which has superior bioadhesive properties, allowing the mother to be ambulatory during labor, is suitable for water births, is not an aqueous solution and does not require a practitioner to apply large amounts.

As described in the attached declaration of the inventor, Dr. Andreas Schaub, in 2004, Dr. Schaub commissioned a pharmacist, Dr. B. Kreyenbühl, to reproduce the formulation of Kasahara for use in human birthing. In his declaration, Dr. Schaub provides the communications and test reports of Dr. Kreyenbühl and provides a summary translation thereof. Dr. Kreyenbühl notes that the exact ingredients of Kasahara were not commercially available because Kasahara teaches that they were obtained from seaweed belonging to the class of brown algae collected in the waters around Japan. As is generally accepted by a person skilled in the art of marine chemistry, both the nature and the amount of the chemical compounds in a specific marine organism differs depending on the habitat of the organism, i.e., the collection site, and the collecting season due to environmental influences. Nevertheless, Dr. Kreyenbühl obtained the closest available substitute, namely sodium alginate and

fucoidin to be used in preparation of the composition described in Kasahara. Dr. Kreyenbühl prepared the formulation and found it to be a viscous, dark brown paste/gel with very limited shelf-life. The resulting gel was manually tested for lubrication potential and bioadhesivity because Dr. Schaub intended to test the composition for use in human birthing. However, the composition of Kasahara did not have the necessary properties required for human birthing in terms of lubrication, appearance, reproducibility, standard guideline for production, sterility, commercial applicability, or shelf-life. As a result, Dr. Schaub was not enabled to use the composition based on the disclosure in Kasahara.

Furthermore, it is posited that the proteins of the Kasahara formulation, and the properties of the composition itself, would be adversely affected, i.e., denatured not only by sitting on the shelf, but by any heat sterilization process that would be applied. As such, the precipitation of the proteins out of solution due to natural and heat-based degradation would likely diminish composition's lubricant properties.

During the April 15, 2010 interview, the Examiner requested a declaration be submitted comparing the present invention to the composition of Kasahara. Applicant submits that the enclosed declaration describes his efforts to obtain the composition of Kasahara, and the clearly poor performance of the composition, and demonstrates that the disclosure of Kasahara failed to enable those of skill in the art to be able to produce a lubricant composition useful for human obstetric methods. Conversely, Applicant submits that, as demonstrated during the interview, the composition for use in the presently claimed method is safe, sterile, has the appropriate appearance, and

unexpectedly superior bioadhesive and lubricant properties to enable one of ordinary skill to practice the claimed method requiring the steps:

"1) applying an effective amount of an organic lubricant composition to cover said birth canal surface with the onset of labor; and

2) additionally applying an amount of said composition to said birth canal surface during labor wherein said additional amount is effective in keeping the birth canal surface covered with said lubricant composition so that a lubricant layer is formed between said birth canal surface and said item to be delivered until said item is delivered."

In view of the above, Applicant believes that a scientifically acceptable comparison with the composition of Kasahara cannot be made. However, if the Examiner believes that such a comparison is required for patentability and has a specific comparison between the present invention and that of Kasahara in mind, Applicant requests that the examiner point out which composition of Kasahara (components and their amounts) is to be compared with the present invention and in what manner the comparison is to be made.

Applicant submits that no combination of the cited references teaches or suggests the presently claimed method steps. Van Leuven and JP '256 instruct the reader to apply the composition "at birth" and that Kasahara mentions "just before parturition" which would have been construed by one of ordinary skill in the art seeking to combine these references as similarly suggesting applying the composition at, or just before birth, rather than "with the onset of labor," which is hours before birth. Moreover,

as all of the cited references are directed to veterinary use, although Kasahara mentions human testing as another option, one of ordinary skill could have only read the references within the context and knowledge available in the art at the time of the invention, and therefore would have attempted to use the cited compositions according to standard techniques known in the veterinary field because no analogous human procedures were available. Moreover, one of ordinary skill in the art would have been an obstetrician. As there was no analogous approved method for human use, an obstetrician would have lacked any training to be able to obviously use the presently claimed method steps. As such, Applicant submits that it would not have been obvious to one of ordinary skill to practice the presently claimed method in any way other than those known in the veterinary field. Thus, based on the above amendments and arguments, Applicant submits that the presently claimed method is not rendered obvious by the combination of the cited art and respectfully requests that the rejection of claim 28 be withdrawn. Claims 30, 32-34, 37, 39, and 41-42, which depend from claim 28 should be allowable for at least the above reasons.

Claim 29 was rejected under 35 U.S.C. § 103(a) as being obvious over Kasahara (U.S. 3,971,848) in view of Van Leuven (U.S. 4,267,168) as evidenced by Bringloe (U.S. 4,765,478) and further in view of JP 46-24256 ("JP '256"). The Examiner acknowledges that Kasahara, Van Leuven and Bringloe are silent as to the amount of sodium polyacrylate, but asserts that JP '256 discloses that sodium polyacrylate is a useful lubricant during birth and that the lubricant does not lose activity when diluted to 0.2-0.3% concentration. Thus, the Examiner asserts that one of ordinary skill would

have been motivated to manipulate the amount of sodium polyacrylate to optimize lubricity. Applicants submit that the JP '256 is another example of the difference between the veterinary and human applications of birthing methods. JP '256 discloses that a solution of sodium polyacrylate, diluted to 0.2-0.3% concentration, fulfills the role of amniotic fluid in animals and is best applied to the animal's vagina by "painting at the time of birth." *See* JP '256 abstract. Thus, applicants submit that, in accordance with the differences detailed above between veterinary methods and those which the present inventor found to be suitable for humans, those of ordinary skill in the art at the time of the invention did not have the necessary knowledge to practice the claimed method for human birthing. These veterinary references do not teach toward the presently claimed method, but rather, they appear to teach the use of aqueous solutions of lubricant compounds, prepared by dilution in water, and application to the animal's vagina at the time of birth. Thus, based on the above amendments and arguments, Applicant submits that the presently claimed method is not rendered obvious by the combination of the cited art and respectfully requests that the rejection of claim 29 be withdrawn. Further, Applicant submits that claim 29 depends from claim 28, which is not rendered obvious by the combination of Kasahara and Van Leuven in view of Bringloe and that JP '256 does not cure the deficiencies of the combination. Thus, Applicant submits that claim 29 is not rendered obvious by any combination of the cited art.

Claim 31 was rejected under 35 U.S.C. § 103(a) as being obvious over Kasahara (U.S. 3,971,848) in view of Van Leuven (U.S. 4,267,168) as evidenced by Bringloe (U.S. 4,765,478) and further in view of Behl et al. (U.S. 5,580,574). The Examiner

asserts that Behl discloses pharmaceutical compositions having CMC in the range of 2 to 5%. Behl is directed to making pharmaceutical compositions for transdermal delivery. Applicant submits that one very important feature of the present invention is that the composition is formulated in such a manner as to largely avoid transdermal penetration, which would be dangerous and not suitable. As was demonstrated during the skin-feel test during the interview on April 15, 2010, the composition forms a lubricant layer on the skin surface and is not appreciably absorbed. Absorption would lead to a diminishing lubricity over labor time and pose a danger to the mother. Thus, Applicant submits that one of ordinary skill intending to produce a suitable birthing gel would not look to a reference for producing transdermal pharmaceutical delivery compositions. Thus, based on the above amendments and arguments, Applicant submits that the presently claimed method is not rendered obvious by the combination of the cited art and respectfully requests that the rejection of claim 31 be withdrawn. Further, Applicant submits that claim 31 depends from claim 28, which is not rendered obvious by the combination of Kasahara and Van Leuven in view of Bringloe and that Behl does not cure the deficiencies of the combination. Thus, Applicant submits that claim 29 is not rendered obvious by any combination of the cited art.

Claims 35-36 were rejected under 35 U.S.C. § 103(a) as being obvious over Kasahara (U.S. 3,971,848) in view of Van Leuven (U.S. 4,267,168) as evidenced by Bringloe (U.S. 4,765,478) and further in view of Kasahara '797 (U.S. Patent 3,814,797). The Examiner asserts that Kasahara '797 discloses introducing 100 ml of the composition (example 2, col. 4 of Kasahara '797). Applicant submits that claims 35 and

36 depend from claim 28, which is not rendered obvious by the combination of Kasahara and Van Leuven in view of Bringloe and that Kasahara '797 does not cure the deficiencies of the combination. Thus, Applicant submits that claims 35-36 are not rendered obvious by any combination of the cited art.

Secondary considerations demonstrating non-obviousness

The presently claimed method is the only one that has been approved for, and is presently being used for, human birthing in Europe and South America. Prior to the present invention, there was no such method approved despite a long-felt and unmet need in the art. This long-felt need is clearly evident based on the number of birth injuries in human obstetrics, which are a leading cause of morbidity and costs in the public health systems world wide. In the U.S., birth injuries are a major cause of medical litigation and lead to approx. $200 Billion in associated costs per year. In the top-10 industrialized countries, 12 million deliveries take place each year. It is estimated that the annual costs involved for labor are $50 billion and the medical costs related to birth trauma at $200 billion per year. In the U.S. alone, birth trauma related medical costs are an estimated $80 billion per year. The anatomy and biomechanics of the labor process differs substantially between animals and humans. Although the use of a lubricant is a standard procedure in veterinary medicine for facilitating obstructed births dating back to ancient times, an analogous method had not been developed for use in humans. In veterinary medicine there are several veterinary medical products available and on the market to reduce frictional forces during vaginal birth (Vetagel®, Celagel®, Bovivet Gel®, Degragel®).

The anatomic situation in animals differs substantially from humans mainly because of the absence of a natural lubricant in humans. Therefore in veterinary medicine the method of birth facilitation is aimed to replace the natural lubricants (allantoic fluid, amniotic fluid) in cases of obstructed delivery, wherein this natural lubricant is lost. Accordingly, in veterinary medicine, the scope of the use of such lubricants is primarily to replace the natural lubricants (allantoic and amniotic fluid) and is of therapeutic indication in cases of obstructed delivery at the end of the birthing process. However, neither in veterinary medicine, nor in human obstetrics, is there a known prophylactic or proactive method for using such lubricants.

Due to these differences between animals and humans, the development and introduction of such a product and method for human obstetrics has proven to be unobvious and earlier attempts have failed to be adopted by those skilled in the art. This is proven by the fact that until the introduction of the presently claimed method into human obstetrics, no lubricating product or facilitation procedure was commercially available for use according to the claimed method.

The complex development process of the presently claimed invention resulted in a gel formulation suitable for use in humans with several unexpected and unobvious properties/effects such as biocompatibility, bactericidal activity, unexpected statistical significant clinical effects (significant reduction of labor stages, significant reduction of birth canal injuries, reduction of episiotomies)—detailed in the peer-reviewed journal article submitted with Dr. Schaub's declaration dated in August 2009, and unexpectedly significant reduction of dynamic friction.

Unmet needs in today's human obstetrics:

Obstetrics faces still several unsolved needs in terms of the reduction of birth injuries in mothers (vaginal lesions, pelvic floor lesions, urinary incontinence, obstetric fistula, etc.) and new borns (clavicula fracture, asphyxia, Cerebral Palsy, etc.) as well as a reduction of interventions (episiotomies, vaginal operative procedures, and Cesarean section). Preventative procedures to reduce the birth trauma risk itself by facilitating vaginal delivery and therefore to reduce morbidity are lacking.

The consequences of vaginal childbirth on maternal and fetal morbidity are estimated to have a significant impact on public health expenditures, short term as well as long term. As an example the impact of birth trauma related damages to the female pelvic floor and to the birth canal is seen to be the leading cause for urinary and fecal incontinence. Furthermore, birth injuries of the newborn are still today threatening the most important step into a new life, birth as a most important determinant.

Today we therefore can identify following main unmet needs in obstetrics:

Maternal unmet needs:

- pain, birth experience
- trauma (pelvic floor damage, uterine rupture):
- urinary incontinence (prevalence ~ 15 %)
- fecal incontinence (prevalence ~ 3 %)
- psychological and sexual dysfunction

Newborn unmet needs:

- asphyxia (subpartu hypoxia)
- birth trauma (neurological lesions, cerebral lesions,...)
- vertical infection (GBS, HIV)

CDC Health Statistics 1999 (CDC: Center of Disease Control)

Number of deliveries	3.8 million
Vaginal deliveries	3 million
Cesarean deliveries	0.8 million
Primary	0.4 million
Secondary	0.4 million

Vaginal delivery outcomes (CDC Health Statistics 1999):

Procedures per vaginal delivery	number	rate
Episiotomy	1.04 million	35.2 %
Forceps Extraction	0.12 million	4.2 %
Vacuum Extraction	0.24 million	8.4 %
Manually assisted delivery	0.8 million	27 %
Repair of obstetric laceration	1.1 million	37 %

Maternal and newborn mortality (US census bureau, 2000)

Maternal deaths	8.4 per 100,000 live births
Neonatal deaths	4.7 per 1000 live births

Infant morbidity due to delivery per year (CDC Health Statistics 1999)

Infant birth trauma	123,000	(3.2 %)
Perinatal infant infections	85,000	(2.2 %)
Disorders relating to high birth weight	201,000	(5.3 %)
Respiratory distress syndrome	390,000	(10.2 %)
Total	799,000	(21 %)

CDC reports:

In developing countries, estimates show that almost 600,000 women die in pregnancy and childbirth each year. UNICEF found that "data show a 20 per cent

increase over previous [UNICEF and WHO] estimates" of some "500,000" maternal deaths yearly. The new data is the product of a "two year" study in which the World Health Organization and UNICEF collaborated with Johns Hopkins University. In addition to the "nearly 600,000" maternal deaths, there is a huge amount of attendant morbidity: UNICEF alleges that "for every woman who dies, 30 more suffer serious pregnancy-related injuries."

Applicant submits that there is clearly a long-felt and unmet need in the field of obstetrics, which is presently being satisfied by the presently claimed method. The presently invention is the only approved method of its kind in Europe and South America and is rapidly being adopted by additional markets. There is a strong interest by large pharmaceutical companies in marketing the invention in the U.S., pending U.S. patent approval before investing in the regulatory process.

Response to Double Patenting Rejection

Claims 28-32 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 38-42, 49-57, and 62-68 of copending application No. 11/718,995. Applicant believes that all of the rejections in this case have been satisfactorily addressed and overcome based on the above amendments and arguments. Under MPEP § 804, if the "'provisional' nonstatutory obviousness-type double patenting (ODP) rejection is the only rejection remaining in the earlier filed of the two pending applications, while the later-filed application is rejectable on other grounds, the examiner should withdraw that rejection and permit the earlier-filed application to issue as a patent without a terminal

disclaimer." Accordingly, because this is the earlier-filed application, Applicant respectfully requests that the provisional double patenting rejection be withdrawn if this application is now in condition for allowance save for the double patenting rejection.

New Claim

Claim 43 has been added to define further embodiments of the invention. Applicants submit that claim 43 finds support on page 7, lines 18-24 of the specification with the recitation of "carbopols." Applicant submits that carbopols are defined as a crosslinked polyacrylic acids. To support this definition, Applicants enclose herewith a research article by De Clercq and Luczak entitled "Antiviral Activity of Carbopol, a Cross-Linked Polycarboxylate," which defines carbopol as "a polymer of acrylic acid cross-linked with allylsucrose" in the first sentence of the Summary on the first page. Applicant submits that none of the cited references disclose the use of a crosslinked polyacrylic acid and is a further distinguishing feature of the presently claimed method over the combination of the cited references.

Conclusion

In view of the foregoing, it is submitted that the present application is now in condition for allowance. Reconsideration and allowance of the pending claims are requested. The Director is authorized to charge any fees or credit any overpayment to Deposit Account No. 02-2135.

A Notice of Allowance is respectfully requested.

The Examiner is invited to telephone the undersigned if it is deemed to expedite allowance of the application.

Respectfully submitted,

By _____

Robert B. Murray
Attorney for Applicant
Registration No. 22,980
ROTHWELL, FIGG, ERNST & MANBECK
1425 K. Street, Suite 800
Washington, D.C. 20005
Telephone: (202) 783-6040

RBM/AHH
Enclosures: 1) Declaration signed by Dr. Schaub and 2) De CLercq et al. article (1976)
1733120